UNITED STATES
CIVIL DEFENSE

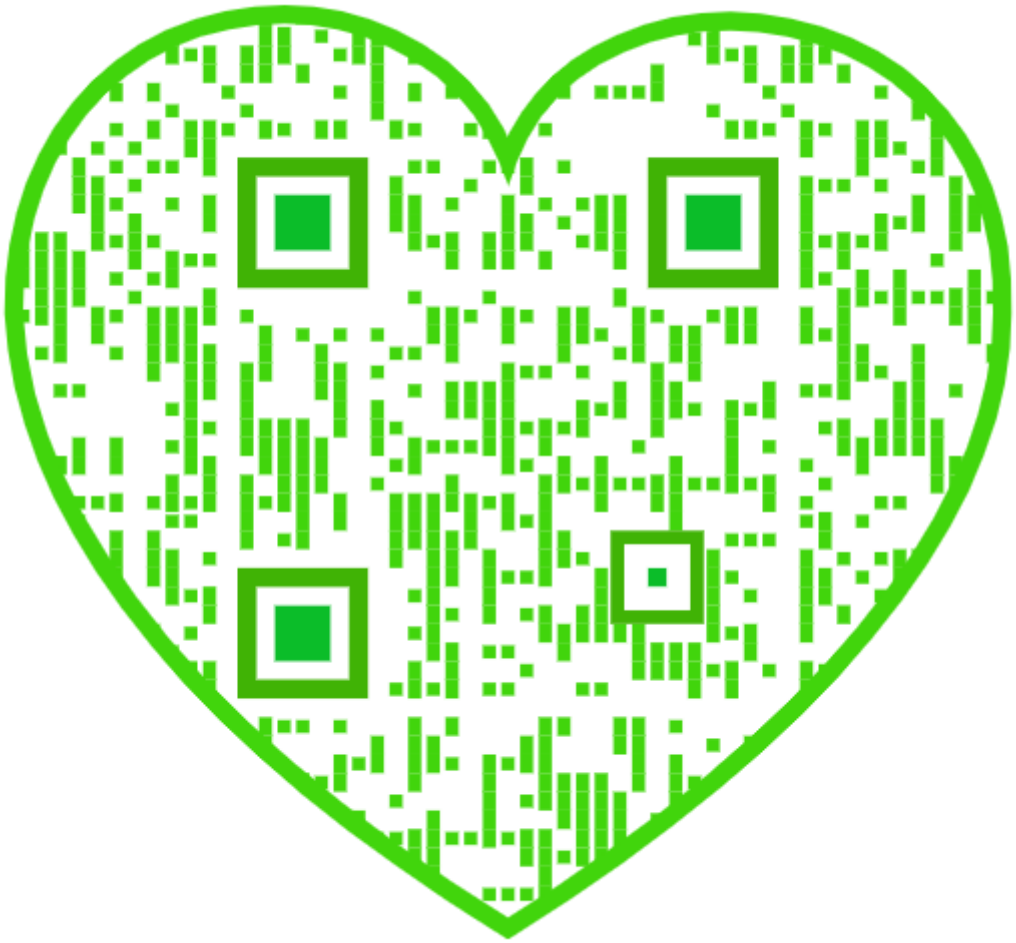
Shelter From Atomic Attack in Existing Buildings

Part I—Method for Determining Shelter Needs and Shelter Areas

TM–5–1

FEDERAL CIVIL DEFENSE ADMINISTRATION

P.D.
FD 1.6/3:5-1



Method for Determining Shelter Needs and Shelter Areas, part I of *Shelter from Atomic Attack in Existing Buildings*, is one of a series of technical manuals prepared by the Federal Civil Defense Administration. These manuals provide detailed technical or specialized information for workers in particular fields of civil defense.

This publication includes instructions, forms, and recommendations for use of civil defense directors, survey teams and their supervisors, and technically qualified personnel in conducting a shelter survey. It sets forth a practical method whereby communities can determine:

(a) The amount of shelter needed in a given area.

(b) The amount of shelter available in existing buildings in that area.

(c) The ch must be provided th

The terri an atomic attack was a. Ameri- can cities a n areas be- cause of th capacities already hav However, before adeq e areas, an analysis of t *Determining Shelter Nee* an analysis and follows n of shelter areas whicl heat, and nuclear radi

Improven om Atomic Attack in i or correct- ing deficien to permit their use as id refers to buildings by iod applied in part I. l utilization of existing l ng manuals in this serie truction of public, as w

Criteria f established by the Lehigh University Institute of Research under a contract with the Office of the Chief of Engineers acting for the Federal Civil Defense Administration. Standards for determining "normal peak" population have been formulated by the Bureau of the Census. These criteria and standards have been analyzed and evaluated by the panel of specialists listed on inside of back cover and, together with material from other sources, have been used in the preparation of this manual.

From the collection of the

San Francisco, California
2008

UNITED STATES CIVIL DEFENSE

SHELTER FROM ATOMIC ATTACK IN EXISTING BUILDINGS

Part I—Method for Determining Shelter Needs and Shelter Areas

FEDERAL CIVIL DEFENSE ADMINISTRATION
(Technical Manual)

For sale by the Superintendent of Documents, U. S. Government Printing Office
Washington 25, D. C. - Price 20 cents

UNITED STATES GOVERNMENT PRINTING OFFICE : FEBRUARY 1952

CONTENTS

Chapter	*Page*
1. Introduction to the survey (Instruction S–101)	1
Major steps in the method	1
2. Preparing for the survey (Instruction S–102)	3
Designation of survey supervisor	3
Division of survey area into blocks	3
Determining procedures for obtaining addresses and type of construction	4
On-street population count	5
Obtaining necessary materials	6
Recruiting and training staff	6
Notifying building managers and others of the survey	7
Preparing field assignments	7
3. Conducting the survey	11
Supervising the field operation (Instruction S–103)	11
General instructions for completing field forms (Instruction S–104)	12
Instructions for completing the block listing sheet, FCDA Form 121 (Instruction S–105)	15
Instructions for completing building analysis schedule, FCDA Form 122 (Instruction S–106)	18
Instructions for completing the on-street population count, FCDA Form 124 (Instruction S–107)	28
4. Editing, scoring, and summarizing the survey	37
Instructions for editing and scoring building analysis schedule, FCDA Form 122 (Instruction S–108)	37
Instructions for summarizing and tabulating shelter areas and population (Instruction S–109)	39
5. Concluding the survey	45
Significance of scores (Instruction S–110)	45
Designation of shelters (Instruction S–111)	47
Use of information for increasing shelter supply (Instruction S–112)	49
Other operations (Instruction S–113)	52
FCDA Forms	
127	10
121	17
122	29
124	36
125	43
126	44

INTRODUCTION TO THE SURVEY (Instruction S–101)

1.1 This set of instructions and forms provides a system or method for determining how many people in designated vulnerable areas require shelter, and the number of people for whom suitable shelter can be found within existing buildings. This will be accomplished by:

(a) Measuring the peak population load in each block to determine the amount of shelter needed. This population count may be limited, as warranted, to commercial, industrial, institutional, and other areas according to the population density. Residential area population counts for the purpose of determining home shelter requirements may be obtained from the files of the Bureau of the Census.

(b) Analyzing and designating all areas within existing buildings or other structures in each block which will provide reasonably safe shelter.

(c) Determining for each block whether there is or is not enough shelter.

(d) Summarizing shelter deficits for those blocks not having enough shelter in order to establish the total amount of additional shelter required for each block and for each vulnerable area.

1.2 The method presented, by virtue of a developed rating system, also will point to conditions which, if changed, would improve selected shelters and buildings suitable for the development of shelters.

Major Steps in the Method

1.3 The method consists of the following major steps, each of which is covered in one or more sections of instructions in succeeding chapters:

(a) Preparing for the survey (Instruction S–102) by selecting a supervisor, obtaining materials, and completing other steps.

(b) Conducting a field operation to obtain the necessary information concerning both building characteristics and population information (Instructions S–103 to S–107).

(c) Conducting an office operation of editing and scoring completed forms (Instruction S–108) and summarizing and tabulating the results (Instruction S–109).

(d) Interpreting the results (Instruction S–110) and carrying out a program of designating shelters (Instruction S–111) and increasing the shelter supply (Instruction S–112).

(e) Maintaining certain records to indicate progress in the shelter program and to provide for possible modification (Instruction S–113).

(f) Preparing completed reports of survey and instructions for forwarding to State and Federal agencies concerned (Instruction S–113).

PREPARING FOR THE SURVEY (Instruction S–102)

2.1 The success of this proposed survey in a particular city or defense area will depend largely on the care and thoroughness with which it is planned and with which the preparatory steps are carried out. The suggestions made below regarding these preparatory steps are intended as the minimum, rather than the maximum number of points that should be covered. These suggestions concern the following:

(a) Designation of a supervisor.

(b) Division of survey area into blocks.

(c) Determining procedures for obtaining addresses, type of construction, and on-street population count.

(d) Obtaining necessary materials.

(e) Recruiting and training a staff.

(f) Notifying building managers and others of survey.

(g) Preparing field assignments.

Designation of Survey Supervisor

2.2 It is assumed that the survey supervisor will be someone in the civil defense organization. Preferably, the person designated should have experience both in survey methods and in structural engineering or building design or construction. If one person with the qualifications is not available, the supervisor should have experience in one of the fields and he should have an assistant with experience in the other. The instructions and suggestions which follow are addressed to the supervisor.

Division of Survey Area Into Blocks

2.3 The method proposed here is designed for application either within the corporate limits of a city or for a larger defense area. In either case, it is necessary that the area be considered in terms of the individual city blocks that comprise it. The block is used as the unit for two reasons:

(a) It is expected that there will be sufficient warning of an attack

to permit persons within a block to reach available shelter within the block, but probably not sufficient time to reach more distant points.

(b) The block is a convenient and recognizable unit for summarization and administration.

2.4 However, not all blocks are of the same size. There probably will be occasions when two small adjacent blocks can be considered together, and other cases where an extremely large or densely populated block may better be considered in parts. The following steps are suggested:

(a) Obtain a map of the survey city or area on which:

(1) The boundaries of all blocks are easily read.

(2) Each block is numbered in a manner that distinguishes it from all other blocks.

(b) Examine the map carefully to see if there are any blocks whose boundaries will cause a problem. Instances of this may be found in newly developed or undeveloped parts of the city where streets are not shown. If any such problems exist, try to insert boundary lines that can be followed in the field.

(c) In addition to numbering the blocks, it may be helpful to identify the particular location of the block. For this purpose census tracts, wards, or some other division of the city may be used.

2.5 If no satisfactory maps showing block and census tract numbers and boundaries are available locally, reproductions of maps prepared for the 1950 census may be obtained from the Bureau of the Census.

Determining Procedures for Obtaining Addresses and Type of Construction

2.6 Within each block it is necessary to locate each building and determine its type of construction. The types of construction which must be distinguished are:

(a) Group A

(1) Steel framed.

(2) Reinforced concrete framed.

(b) Group B

(3) Semiframed (steel or reinforced concrete).

(4) Masonry wall bearing.

(5) Wood frame (masonry or wood or other covering).

(6) Other.

2.7 Type of construction is basic to the selection of shelter, and it is essential that the information be accurate.

2.8 There are a number of ways in which this information may be obtained. These are:

(a) Maps showing the type of construction of building and use.

(b) Local index to buildings showing type of construction, such as is maintained by some fire departments and building inspection departments.

(c) The preparation of such an index from available building inspection or permit records.

(d) A preliminary investigation in the field by technically trained personnel to determine types of construction.

(e) Obtaining the information as a part of the general survey, with cases of doubt being resolved through field inspection by technically trained personnel.

2.9 If at all possible, the above information should be obtained from a central source for buildings other than private dwellings. In the case of private dwellings this is not necessary. The procedure given below assumes the information is available from a central source. If it is not, then the procedure should be modified in accordance with the chosen alternative.

On-Street Population Count

2.10 To obtain the total number of persons for whom shelter must be provided in a given block, it is necessary to count the people on the street and add this total to the population count in the buildings. The on-street population count is designed to obtain the normal on-street population. Therefore, counts should not be made during the hours most workers in buildings are going to work, leaving work for home, or going to lunch.

2.11 While the normal on-street population may vary among certain sections of the city, traffic studies indicate that the period between 10 a. m. and 11 a. m. in the morning and between 2 p. m. and 3 p. m. in the afternoon are likely to be the times when there is a normal on-street population. In residential areas, where the street population is relatively light, no street population count need be made.

2.12 The supervisor, therefore, has three tasks: First, to decide in which blocks to make on-street population counts; second, to prepare the forms for the counts; and third, to instruct field workers as to where and when to make the counts. It is important that the observers take the count only at the time specified by the supervisor.

Obtaining Necessary Materials

2.13 Before beginning this survey, the supervisor must be sure that sufficient supplies are available. The following materials are needed:

(a) For the supervisor:

INSTRUCTIONS

S–101—Introduction to Survey.
S–102—Preparing for the Survey.
S–103—Supervising the Field Operation.
S–110—Significance of Scores.
S–111—Designation of Shelters.
S–112—Use of Information for Increasing Shelter Supply.
S–113—Other Operations.
Transmittal Form.

(b) For the field workers:

INSTRUCTIONS

S–104—General Instructions for Completing Field Forms.
S–105—Completing Block Listing Sheets.
S–106—Completing Building Analysis Schedules.
S–107—Completing On-Street Population Count.
Introductory Letter.

FCDA FORMS

121—Block Listing Sheet.
122—Building Analysis Schedule.
124—On-Street Population Count.

(c) For the office worker:

INSTRUCTIONS

S–108—Editing and Scoring.
S–109—Summarizing and Tabulating.

FCDA FORMS

125—Protected Areas by Rating Score.
126—Block Summary of Building Analysis.
127—Assignment and Control.

2.14 In obtaining supplies, estimates for loss and spoilage should be allowed.

Recruiting and Training Staff

2.15 Technically trained personnel should be utilized whenever available since experience has indicated that time and effort will be saved if the data for rating buildings contained in FCDA Form 122 is compiled by persons familiar with building construction. Professional people such as architects and engineers or their experienced personnel should be used to the maximum extent possible. Builders, construction men, and others familiar with building construction are also considered well qualified for making the field survey.

2.16 Since technically trained personnel may not be available for the field survey teams, block wardens can be utilized where a warden system has been established for a city. Such a system will prove advantageous to the wardens since they will acquire considerable information about the characteristics of good shelters, and become familiar with the size of the problem in their jurisdiction.

2.17 For those areas in which there is no warden system, and no available trained personnel, it will be necessary to recruit and train a staff. The staff required, naturally, is dependent on the size of the area and the size and type of its buildings. Roughly, it will require three man-days to complete a block containing commercial structures, and about one-half man-day for the usual residential block. These guides also may be used in determining whether a particular warden has sufficient time available to obtain the required information. In addition to the field staff, office workers will be needed to summarize and tabulate the information. A ratio of one office worker for eight field workers appears reasonable.

2.18 All persons associated with the survey should receive thorough training in their assignments. This factor cannot be overemphasized. A period of study of the pertinent instructions, followed by practice at filling out the forms, using several typical buildings, should be part of each person's training. In all cases, the need for accuracy and completeness should be stressed.

Notifying Building Managers and Others of the Survey

2.19 Public announcements of the survey and its purpose should be made. These will assist the field staff in obtaining the required information in the minimum time. If possible, a letter also may be sent to building owners or managers individually, explaining the nature of the survey and expressing the hope that information will be assembled and ready for completion of the building analysis schedule upon the arrival of the representative. A suggested form of this letter is included with these instructions (p. 9). Each field worker should be given carbon copies of the letter.

Preparing Field Assignments

2.20 Before the survey teams are sent into the field, the following steps are necessary:

(a) *Preparing FCDA Form 121 (Block Listing Sheet).*—The heading of FCDA Form 121 should be filled in for each block. For blocks known to contain commercial, industrial, institutional, or apartment buildings (that is, any building other than a private dwelling) each address in the block should be entered in column 2, and "yes"

or "no" placed in column 3 to indicate which addresses represent private dwellings and which represent other buildings. In listing addresses, begin at the northwest corner of the block and proceed in a clockwise fashion around the block and back to the starting point.

(b) *Preparing FCDA Form 122 (Building Analysis Schedule).*—For each building other than a private dwelling, or a building of three or less stories without basement, an FCDA Form 122 should be prepared. The building number should be filled in from the corresponding FCDA Form 121 line, and items 2, 3, 4, 5, and 6 completed. If the information has been obtained on type of construction this should be entered in item 16.

(c) *Preparing FCDA Form 124 (On-Street Population Count).*—For each block in which it has been determined that an on-street count is required, an FCDA Form 124 should be prepared. Complete the heading items of *Block No.*, *Tract No.*, and *City*.

(d) *Assembling assignments.*—For each block assemble the FCDA Forms 121, 122, and 124, if required, and sufficient blank forms, including some of the introductory letters. If, in addition to the block boundaries, the field worker will require a map or directions to reach the block, these should be included.

(e) *Establishing an assignment and control register (FCDA Form 127).*—In order to control the work it is suggested that an assignment and control form be set up, as follows:

(1) In column (*1*) enter the block numbers in consecutive order.

(2) In columns (*2*) and (*3*) enter the name of the person who was assigned the block and the date the assignment was made.

(3) In column (*4*) enter the date the materials were received for the completed block.

(4) In column (*5*) enter the number of addresses listed on FCDA Form 121 for the block.

(5) In column (*6*) enter the number of buildings for which an FCDA Form 122 was completed. ("No" in columns (*3*) and (*6*) of FCDA Form 121.)

(6) In column (*7*) enter the date all of the schedules of a block were edited and scored.

(7) In column (*8*) enter the date that the FCDA Form 126 was completed.

(8) In column (*9*) enter the date that the FCDA Form 126 was mailed to Washington and the State civil defense organization.

SUGGESTED INTRODUCTORY LETTER

(Official name of local civil defense organization)
(Street address)
(City and State)

Date
(Set up for mailing in window envelope.)

Dear Sir:

We are making a comprehensive survey to determine whether any buildings as they now exist contain areas which would offer relatively adequate protection from the effects of an atomic attack. Generally, some of the basic information we need is:

(a) The number of persons working in your building and the estimated number of transients at normal peak on each story.

(b) The thickness and type of exterior and interior walls, partitions, floors, and roof.

(c) A floor plan (or a rough line sketch) of each story showing the permanent interior walls and the dimensions between walls.

These items may require some research on your part. Some remaining questions probably can be answered through your general knowledge of the building.

It will help us immeasurably if you could obtain the above information prior to the visit of our representative who will call in a few days.

(Signature of head of civil defense organization.)

FCDA FORM 127
JUN 1951

Form Approved
Budget Bureau No. 97-51D3

ASSIGNMENT AND CONTROL

SHEET_____ OF_____ SHEETS

CITY_____

TRACT NO._____

BLOCK NO.	ASSIGNED:		DATE COMPLETED	NUMBER OF UNITS		DATE EDITED AND SCORED	DATE FCDA FORM 126 COMPLETED	DATE TRANSMITTED
	PERSON	DATE		ADDRESSES ON FCDA FORM 121	FCDA FORMS 122 COMPLETED			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)

CONDUCTING THE SURVEY

Supervising the Field Operation (Instruction S–103)

Reviewing Completed Forms

3.1 As completed block forms are turned in, the supervisor should check in detail the entries on the block listing sheet, FCDA Form 121, and each building analysis schedule, FCDA Form 122. This should be done with the person who has completed the forms so that if there is any omission or inconsistency, the field worker may supply or obtain the necessary information.

3.2 If any field worker's forms contain any consistent errors or omissions, the supervisor should repeat the instructions concerning each such item in detail to insure a complete understanding of these items.

3.3 If there are any rough line sketches of floor plans of buildings on separate sheets these should be attached to the appropriate schedule.

Spot Checking

3.4 To make sure that each field worker understands how to fill the forms, a few of his building analysis schedules from among those completed early in the survey should be selected for spot-checking. This would involve revisiting the building, going directly to several of the selected shelter areas and verifying the information on the schedule. Include in the verification either all items, or as a minimum a count of the number of floors overhead, a count of the number of walls from the shelter area to the outside, the presence of a glass hazard, and either exits or stairwells as appropriate.

Flow of Schedules

3.5 As schedules and listing sheets are turned in and reviewed, they should be routed to the persons who will edit and score them. The block listing sheet, the on-street population count form, and all building analysis schedules for a block should be kept together as a unit throughout the entire processing. The steps in the office operation are as follows:

(a) Check in all completed forms for a block.
(b) Review all completed forms for completeness and consistency.
(c) Edit and enter rating scores on the building analysis schedules.
(d) Summarize the square feet of the shelter areas by rating score

(FCDA Form 125) for each building for which a schedule was completed.

(e) Prepare a summary of the block on FCDA Form 126.

Refusal Cases

3.6 In a few cases, a respondent (person who supplies the information) will refuse to give any information about the building to the field worker. The supervisor should call on the person who refused, explain the purpose of the survey in detail, and attempt to obtain the information. If the respondent still refuses, find out the name of the owner and try to get clearance through that source. It may be that a building manager has strict orders from his superiors not to give out any information.

Obtaining Missing Information

3.7 In cases where a schedule has several omitted entries, the supervisor or someone he designates should attempt to obtain the information by telephoning the person who gave the information. If this is not possible, a personal visit should be made.

Use of City Map

3.8 A large-scale city block map can be used to give a quick visual appraisal of the progress of the survey. The mid-city, industrial, and residential areas can be outlined on this map. As a block is completed, the supervisor can either color in that block, or use a "spot pin" to designate that the block is completed. Later, this map also may be used to designate blocks with or without surplus protected areas.

General Instructions for Completing Field Forms (Instruction S–104)

3.9 This survey is being conducted to determine the characteristics of buildings from the viewpoint of their ability to offer possible shelter against the effects of atomic attack. The amount of information to be obtained depends on the size, type of construction, and use of the building. For private dwellings only, address, number of persons staying in the dwelling, and the existence of a basement are listed.

3.10 Try to ask questions and obtain information without indicating the adequacy or inadequacy of a particular building or a particular area. While this survey is intended to make possible the designation of certain areas in existing buildings as shelter areas, such designations cannot be made until the information gathered has been correlated and evaluated.

MATERIALS TO BE USED

3.11 In addition to these general instructions, field workers will use the following:

(a) *FCDA Form 121 (Block Listing Sheet).*—This provides for a listing of the addresses of buildings which are to be canvassed. The required information for private dwellings is entered on this sheet.

(b) *Instruction S–105 (Instructions for Completing the Block Listing Sheet).*—These provide instructions for completing FCDA Form 121.

(c) *FCDA Form 122 (Building Analysis Schedule).*—An analysis is to be made and recorded on FCDA Form 122 for each building other than certain types of private dwellings and small buildings of three stories or less that have no basements.

(d) *Instruction S–106 (Instructions for Completing the Building Analysis Schedule).*—These are the detailed instructions for completing FCDA Form 122. They should be understood clearly before any attempt is made to complete a schedule. If you are in doubt about a particular point on FCDA Form 122, refer to these instructions.

(e) *FCDA Form 124 (On-Street Population Count Sheet).*—This provides the means for entering the pedestrian and vehicular population count.

(f) *Instruction S–107 (Instructions for Completing the On-Street Population Count Sheet).*—This provides instructions for making an on-street count of the pedestrian and vehicular population and completing FCDA Form 124.

(g) *Introductory letter.*—This letter briefly explains the purpose of the survey and will have been sent to the person supplying the information or given to him at the start of the interview.

(h) *Other supplies.*—A portfolio, pencils, scratch pads, and possibly a city map also will be needed.

GENERAL INTERVIEWING RULES

3.12 The following general interviewing rules will help the field worker in his job:

(a) Be sure to identify yourself by showing your credentials.

(b) Approach the person as follows: "I'm (your name) from the (city) civil defense. We're obtaining information to determine whether there is potential shelter space in existing buildings. * * * May I have your name and title?"

(c) For each question you ask, make sure your respondent understands exactly what is wanted.

(d) If you have to explain an entry in the remarks section, enter a number in parenthesis, for example (1), next to the entry requiring

further explanation; repeat this number in the remarks section and describe the situation.

(e) If an item of information cannot be obtained, enter "na" (not ascertainable) in the appropriate item. However, make every possible effort to complete each item.

(f) Do not use dashes or ditto marks on any of the forms.

(g) For larger buildings, your best source of information will be the building manager, superintendent, or engineer. In smaller buildings, locate the janitor or watchman. If there is none, interview one of the occupants.

Canvassing and Interviewing

3.13 Although you may occasionally be assigned a single building to canvass, ordinarily you will be assigned a city block. In some cases you will receive a block listing sheet with only the heading completed. If so, usually this will be for a block that is entirely or almost entirely devoted to private dwellings. In other cases, addresses will have been listed and if FCDA Form 122 is required, its heading will have been filled in.

3.14 Follow these rules:

(a) Go to the first address listed or, if none is listed, to the northwest corner of the block.

(b) Proceed in a clockwise fashion around the block, obtaining the required information for each building, until you return to your starting point.

(c) Make sure the information on FCDA Form 121 is completed for each building, and FCDA Form 122 is completed for each building for which it is required.

(d) At each address interview a responsible person.

(e) If, for a larger building, you are unable to see the building manager on your first call, try to make a definite appointment for later and enter the date and time of the appointment in column 8 of the block listing sheet.

(f) If you are refused information, try to explain the purpose of the survey and the need for cooperation. If the information is still refused, note this fact in column 8 of FCDA Form 121.

(g) When you have completed all required forms and schedules for a block, return these to your supervisor.

(h) Remember that the results depend on the accuracy of your work. Certain buildings may be recanvassed to determine the feasibility, the cost, and the method of removing some hazard or making some improvement in a potential shelter area.

Instructions for Completing the Block Listing Sheet, FCDA Form 121 (Instruction S–105)

3.15 Usually, for purposes of canvassing, each city block (bounded by four streets or three streets and a railroad or other combination) is considered as a unit. For each such unit you will be furnished a block listing sheet, FCDA Form 121.

Items Completed

3.16 Usually, FCDA Form 121 will have all of the following items completed:

(a) *Block number.*—This number identifies the block from all other blocks.

(b) *Tract number.*—This helps identify the section of the city in which the block is located.

(c) *City.*

(d) *Enumeration of sheets.*—This is to indicate whether more than one sheet is required for a particular block.

(e) *Block boundaries.*—This gives the north, east, south, and west boundaries of the block. In completing this assignment, you must be sure you canvass only *within* these boundaries.

(f) *Building number.*—This provides a handy reference to the buildings within the block.

(g) *Address.*—This contains the street addresses of all buildings insofar as they are known to exist. In certain sections of the city, this item may not have been completed.

Items You Are To Complete

3.17 You are to complete the following items on the block listing sheet, FCDA Form 121:

(a) *Assigned to.*—Enter your name in this space to indicate you are responsible for canvassing this block.

(b) *Column 2, Address.*—Usually the addresses already will have been entered. If not, or if there are any differences or additions, these should be handled as follows:

(1) Definition of a building: For the purpose of this survey a building is defined as a structure that is separated from adjoining buildings, from ground to roof without any connecting doorways. Where two or more buildings of an organization (such as a hospital) are physically separated but connected by tunnels or ramps, each building is to be considered separately.

(2) It may happen that two addresses listed on separate lines apply to one building. If so, in the remarks, column 8, make a statement to that effect. Be sure to have the full correct address on the schedule you use for such buildings.

(3) As you canvass a block, you may find a building whose address is not listed. Enter this address on the first unused line of the block listing sheet and note in remarks, column 8, that it is new. Be sure to complete a schedule for the building if required. Do NOT list such places as private garages, sheds, shacks, barns, and similar places.

(4) If you cannot locate the building of a listed address, note in the remarks, column 8, "cannot locate."

(5) If the building is vacant, note it in the remarks, column 8. In addition, try to find out the name of the realtor in charge of the building and enter this information in the remarks, column 8.

(c) *Column 3, Private dwelling.*—Enter "yes" in this column if the building is a private dwelling.

(1) Definition of a private dwelling: For the purposes of this survey, a private dwelling is defined as a house occupied exclusively for living purposes by one or more family groups, or an apartment building consisting of not more than a basement and three occupiable stories.

(2) A private dwelling may be a detached, semidetached, or row house.

(3) Large apartment buildings or flats of four or more stories are NOT to be considered private dwellings.

(4) Enter "no" in column 3 if the building is not a private dwelling as defined above. If "no" is entered here, skip to column 6. If "no" is entered in column 6, a building analysis schedule, FCDA Form 122, must be completed for the building. If "yes" is entered in column 3, complete columns 4 and 5; these are to be used for private dwellings only.

(d) *Column 4, Number of persons.*—Enter the usual number of residents or occupants that stay in the dwelling. Do not include visitors who are staying for a relatively short period of time.

(e) *Column 5, Basement.*—If the building has a basement, enter "yes"; if not, enter "no." For private dwellings an area below ground level will be considered a basement if the basement floor is 5 feet or more below ground on all four sides.

(f) *Columns 6 and 7, Is this building three or less stories and without a basement?*—Enter "yes" in column 6 if:

(1) Building is three or less stories without a basement.

(2) Building is less than three stories with a basement (i. e. two stories and a basement).

This applies to both Group A and B buildings as designated on page 4. If not, enter "no."

If "yes" is entered in column 6, enter the total number of persons in the building in column 7. Be sure to include both the normal

BLOCK LISTING SHEET

Form Approved
Budget Bureau No. 97—S103

BLOCK NO. _____ TRACT NO. _____ SHEET _____ OF _____ SHEETS

CITY _____ ASSIGNED TO: _____

BLOCK BOUNDARIES: NORTH _____ EAST _____ SOUTH _____ WEST _____

BLDG. NO.	ADDRESS	PRIVATE DWELLING (YES OR NO)	FOR PRIVATE DWELLINGS ONLY		IS THIS BUILDING 3 OR LESS STORIES AND WITHOUT A BASEMENT?		DATE & TIME FOR CALLING BACK OR REMARKS	DATE COMPLETED
			NO. OF PERSONS	BASE-MENT (YES OR NO)	(YES OR NO)	IF YES, NO. OF PERSONS		
1	2	3	4	5	6	7	8	9

FCDA FORM 121
JUN 1951

peak shopper population if there is a store in the building, and the occupants on the upper stories (tenants, office workers, visitors, and others). If "no" is entered in both columns 3 and 6, a building analysis schedule, FCDA Form 122, must be completed for the building.

(g) *Column 8, Date and time for calling back or other remarks.*—If you are not successful in getting the information on the first visit, try to make a definite appointment with the appropriate person. If you can arrange an appointment, enter the date and time here. This column also is to be used for remarks of certain situations indicated under the instructions for column 2, as well as any other pertinent explanations.

(h) *Column 9, Date completed.*—Enter the date of completion. For private dwellings and buildings of three or less stories without a basement, the date of completion is when columns 3, 4, and 5, or columns 6 and 7, respectively, are filled.

Instructions for Completing Building Analysis Schedule, FCDA Form 122 (Instruction S–106)

3.18 Building analysis schedule, FCDA Form 122, is to be completed for all buildings other than private dwellings and buildings of three stories or less without a basement (see definition in Instruction S–105, Completing Block Listing Sheets). If possible this form should be checked in the field by technically trained personnel.

3.19 Some of the items are to be obtained by observation while others are to be obtained by questioning a responsible person such as the building manager.

Items 1 Through 6—Identification

3.20 Items 1 through 6 will normally have been completed when you receive the schedule. If any corrections are necessary, draw a line through the original entry and write the correction above. If they have not been entered, items 1, 2, 3, 4, and 6 should be transferred from block listing sheet, FCDA Form 121. Item 5, *Name of Building*, should be ascertained and entered. If the building has no name, enter "none."

Item 7—Person in Charge of Building

3.21 Under *a* enter the name of the owner or the owner's representative, agent, or manager who is legally responsible for the building. Under *b* enter this person's address.

Item 8—Person Supplying Information for This Form

3.22 Complete this item if the person supplying the information is different from the person listed in item 7. Under *a* enter the name,

under *b* the address, under *c* the title (such as building manager, engineer, janitor, or owner of first floor store), and under *d* this person's telephone number. If the person supplying the information is named in item 7, enter "same as item 7" under *a* and complete *c* and *d* only.

Item 9—Principal Use of Building

3.23 Place an x in the square in front of the appropriate category. Check only one item. If a building has mixed occupancy (such as stores on the first floor and apartments above) choose the category of principal use on the basis of approximate amount of square footage occupied. If the use is not covered in one of the categories listed, check *Other* and enter principal use.

Item 10—Year Built

3.24 If it is possible to obtain the date of construction enter it here. If approximate date cannot be obtained, enter "na." If a substantial addition or annex has been built, enter here the year the original structure was built and in the remarks section the year the annex was built. If construction continued over several years, enter the year work was completed.

Item 11—Number of Stories

3.25 The number of stories is determined by starting the count with the first story above the basement, usually the story at ground or street level, and counting upward. Include stories whether numbered or not, such as mezzanines, 13th story, lofts, and attics. Basements and sub-basements are not included in this count. For buildings of unusual construction where there is no regular pattern of stories (such as theaters and auditoriums) describe the situation in the remarks section.

Item 12—Height in Feet

3.26 Estimate the height of the building proper at the tallest point. Exclude special features above the general roof level, such as towers, steeples, and elevator penthouses.

Item 13—Hours of Operation and Occupancy

3.27 This item should be completed as follows:

(a) *Hours building is open.*—Enter separately the inclusive hours the building is open on Mondays through Fridays, on Saturdays, and on Sundays and holidays. If, for any of these categories, the building is open the full 24 hours, do not fill in the hours but place a check mark in the square in front of *all hours*.

(b) *Hours of normal peak occupancy.*—Determine the period on Mondays through Fridays during which 80 percent or more of the people normally occupying the building are present, and enter the inclusive hours. Do the same for Saturdays and for Sundays and holidays. If there is practically no change during the 24-hour period, check *all hours*. For example, an office building might, from 8 a. m. to 5 p. m. on Mondays through Fridays, be occupied by 80 percent of the resident occupants, but from 5 p. m. to the following 8 a. m. be relatively empty. In this case 8 a. m. to 5 p. m. would be entered. The normal peak of Saturday occupancy might occur between 8 a. m. and 1 p. m., in which case these figures would be entered next. On Sundays and holidays, there may be no change through the 24-hour period, with only a relatively small number of service employees occupying the building; then, *all hours* would be checked.

(c) *Number of persons at normal peak occupancy.*—Enter an approximate count of entire population of the building during the peak occupancy periods determined under (b) above. This population count should include both residents and transients, and should be determined separately for each of the three categories.

Item 14—Surrounding Hazards

3.28 If the block in which this building is situated or if any block adjacent to this block contains large quantities of stored flammables or explosives, check *yes* and give details. Gasoline storage tanks, explosive storage installations, chemical production plants, refineries, and the like should be considered as hazards, but ordinary gasoline service stations or paint stores should not. If there is no neighborhood hazard, check *no*.

Item 15—Structural Features

3.29 This item should be completed as follows:

(a) *Exterior walls.*—Enter the thickness in inches and the materials forming the exterior walls of the building. An exterior wall is a wall forming one of the boundaries of the building regardless of whether or not it is actually exposed. Examples are brick curtain, brick and block curtain, and others. If the thickness varies from story to story, give the details in the remarks section.

(b) *Interior walls.*—Enter the thickness in inches and the materials forming the interior walls. An interior wall is a wall incorporated into the original design of the building or installed as part of a major alteration. Interior walls should not be confused with light partitions frequently used to subdivide office space. Types of interior walls are hollow tile, gypsum block, cinder block, wood frame and plaster.

(c) *Partitions.*—Enter the thickness in inches and the materials forming the partitions of the building. Partitions are frequently made of light metal, plywood, glass, composition board, and similar materials and are usually installed in such a way that they can be moved without major alterations to the building.

(d) *Floors.*—In large framed buildings, floors are usually of uniform thickness and materials. In smaller buildings the first floor may be different from the others. Report any unusual conditions in the remarks section.

(e) *Roof.*—Enter thickness and principal material of roof.

ITEM 16—TYPE OF CONSTRUCTION

3.30 Normally, this item will be completed when you receive the form. Verify it by questioning the person being interviewed and note any discrepancy in the remarks section. If this item has not been completed, obtain the information and check the appropriate category. If the building is of a type not listed, check *other* and specify the type as fully as possible. Basic building types for the purposes of this survey are briefly described as follows:

(a) *Group A buildings.*—Group A or framed buildings are those in which a framework of reinforced concrete or steel carries the load of floors and walls, and in which the walls themselves carry only their own weight. Buildings of eight stories or more usually are framed buildings.

(b) *Group B buildings.*—Group B buildings are those in which the walls carry some or all of the load, or those in which the framing is wood. The following are examples:

(1) *Semiframed buildings.*—A semiframed building is one in which part of the weight of floors and interior walls is carried on a steel or reinforced concrete framework but in which the exterior walls carry some of the load of floors and roof. The large range of variation in types of semiframed buildings indicates the desirability of placing them all in a category which would permit their consideration as shelter only after thorough investigation by trained personnel.

(2) *Masonry wall-bearing buildings.*—A masonry wall-bearing building is one in which the exterior masonry walls carry the bulk of the weight of floors and walls even though unframed columns and beams may be present.

(3) *Wood frame buildings.*—A wood frame building is one in which wooden beams and studs carry the load. The exterior may be covered with siding, clapboard, shingles, or a veneer of masonry.

Instructions for Group A Buildings

3.31 If any category in Group A is checked (that is, if the building is a framed building), select two potential shelter areas in the basement and two in the sub-basement (if any) and two in each story except the top three. Complete items 17 through 37 for each selected potential shelter area, and complete items 35, 36, and 37 for the top three stories as well. If there is no basement or no sub-basement, enter "none" across the top of the appropriate column.

Instructions for Group B Buildings

3.32 If any category in Group B is checked, select two potential shelter areas in the basement and two in the sub-basement (if any). Do NOT select areas in any story above ground level since these areas if necessary for shelter will be selected by technical teams. Complete items 17 through 37 for each of the areas selected. If there is no basement or no sub-basement, enter "none"across the top of the appropriate column.

Instructions for Combinations of Group A and B Buildings

3.33 If a building has two or more types of construction, a separate schedule (FCDA Form 122) should be filled out for each part that is Group A construction and for each part that is Group B construction. Enter only one set of population figures for the entire building (by story) on the Group A schedule. If the entire building has one common basement, include the information from it on the Group A schedule. Be sure to explain the situation fully and include a sketch showing the general locations of the various types of construction.

Items 17 Through 37—Characteristics of Potential Shelter Areas

General instructions for selecting potential shelter areas

3.34 Shelter against atomic attack should provide protection against the effects of blast, heat, and radiation. Obviously, therefore, any area selected as potential shelter should be in the center or core of the building, away from exposure to the outside. The following brief suggestions will aid you in selecting potential shelter areas on each story:

(a) The areas selected should be as far away as possible from the outside. Courts, light shafts, and the like should be taken into account as well as outside walls.

(b) The areas selected should be in a part of the building that is structurally compact, with a close spacing of columns and short-span floor beams.

(c) The area should be out of direct line with doors, windows, and hallways having exposure to the outside.

(d) The walls and doors immediately surrounding the areas should be free of glass.

(e) There should be at least one interior stairway (that is, one not adjoining an outer wall) within each selected area or near it.

(f) The areas selected should contain no furnaces or boilers, and no LARGE steam, water, or gas pipes.

(g) The ceiling should not be of the hung or suspended type.

(h) The ceiling should not have heavy lighting fixtures or plaster ornaments.

(i) The floor directly above the area selected should not have any unusually heavy concentrated loads, such as safes, banks of filing cabinets, heavy presses, or other machinery.

(j) The areas should be as free as possible of furniture, stored merchandise, and equipment of any kind.

3.35 Very few areas will have all of these characteristics. Your task is to choose areas that most nearly fulfill these requirements, which are listed in approximate order of importance.

3.36 Try to find areas of maximum size that seem to qualify. Do not consider closets or other isolated areas of very small size.

3.37 Some stories may have areas that do not even come near qualifying as protection. Even if such is the case, select the relatively best area and investigate it.

3.38 In most large buildings, floor plans will be available, and these should be used in determining a shelter area. In addition, it is desirable that a rough line sketch be drawn in the remarks section of a typical floor (above the second) showing the outer and interior walls, the dimensions of the entire building, and the two potential shelter areas.

3.39 In some cases, a story may be an entirely open room with no interior walls. This will be especially true of basements. When this situation is found, consider an area in the central part of the floor surrounded by an imaginary line 20 feet from outside walls in each direction, and obtain the information for this area.

Instructions for special types of buildings

3.40 The following suggestions indicate some locations which may qualify as potential shelter areas in certain kinds of buildings:

(a) Office buildings, hotels, apartments, and others.

(1) Elevator lobbies.—These are usually located near the center of the building and, if so, should be considered. However, elevator lobbies on the first floor (and possibly the mezzanine and second floor) are frequently in direct connection with the outside or contain large areas of glass.

(2) Rest rooms.—Some rest rooms are located in the center of the building; these should be considered.

(3) Stairwells.—These also are frequently located in the core of the building and offer good possibilities as potential shelter areas.

(4) Interior halls.—These usually run through the center of the building with rows of offices on either side. Areas in halls which are free of glassed doors and walls are good choices.

(5) Basements.—Basements usually contain the building's utility equipment, which may be dangerous to occupants if damaged. If possible, areas selected in basements should be some distance from the utilities.

(b) Theaters and auditoriums.—The main auditorium of theaters and other large places of assembly rarely will be considered as potential shelter areas, because few such places have a large enough number of floors overhead to give them sufficient protection in that direction. Even when a theater is located at the ground level of a multistoried building, the main auditorium should not be selected as potential shelter area if any other parts of the building are available for that story. Open areas with long-span ceilings should generally be avoided. If, however, no other space is available for consideration, the main auditorium of a theater should be rated, and special care should be taken to see that the code for auditoriums (AU) is entered after item 19, *normal use*.

(c) Churches.—In considering churches, the cautions stated above concerning large auditoriums apply. Small rooms in the basement or on the first floor may be potential shelter areas.

(d) Schools.—In schools, the corridors and basement are likely possibilities. Auditoriums and gymnasiums should not be given first consideration for the reasons stated in (b) above.

(e) Other structures.—Special structures such as tunnels, subways, and others will often be capable of providing shelter for large numbers of people. If such conditions are found, notation of this fact should be made, together with approximate size of possible shelter area, and the matter should be brought to the attention of your supervisor. No attempt should be made at this time to analyze the structures.

Summary

3.41 To summarize, a shelter area should be so located that there is the maximum amount of dense material between it and the outside of the building. If possible, it should be enclosed by four walls. It should be the largest area which meets the greatest number of listed characteristics. Be sure to explain any unusual situations in the remarks section.

3.42 Items 17 through 37 should be completed as follows:

(a) *Item 17—Story number.*—The columns headed *Sub-basement*, *Basement*, *1st story*, *2nd story*, etc., should be used for the potential shelter areas selected on each level. If a particular building requires more columns than those provided, continue by using a blank schedule, changing *1st story* to *11th*, *2nd* to *12th*, etc. If the building is taller than 20 stories, use a third schedule, altering *1st story* to *21st*, etc. Be sure to complete items 1 through 6 on any additional schedules used, and in the upper right hand corner of the first page of each, write "1 of 2," "2 of 2," etc., as appropriate. Some buildings have mezzanines, lofts, second sub-basements, and other areas for which there are no provisions. In such cases, use the blank columns at the right and enter the appropriate headings.

(b) *Item 18—Potential shelter areas.*—The columns headed *1* and *2* should be used for the two potential shelter areas selected on each level. Two columns have been provided because it has been found that generally there are no more than two usable areas on any floor. If only one area can be found on a story, as on a floor entirely open, column *2* should be left blank. If more than two areas are available, make a note in the remarks section and use an additional copy of FCDA Form 122 to describe these. Change the column headings as appropriate.

(c) *Item 19—Normal use.*—Enter here the following abbreviation which best describes the normal use of the potential shelter area:

H—Hall	OR—Office Room
SW—Stairwell	SR—Storage Room
EL—Elevator Lobby	AU—Auditorium
RR—Rest Room	OT—Other

If "OT" is entered, describe the area in the remarks section.

(d) *Item 20—Square feet of usable space.*—The total square footage of the selected area can usually be calculated from the floor plan if this is available. If not, pace off the length and width of the area and compute the total square feet. From this total figure must be subtracted the amount of space occupied by files, desks, chairs, equipment, machinery, counters, merchandise, and other material normally found in the area. Insofar as possible, each area should be one contiguous area, not several areas combined. However, if it happens that a long hall has several areas which are superior to others in that

hall, include the square feet of each of these areas and note the situation in the remarks section.

(e) *Item 21—Glass hazard (yes or no).*—Any glass in the walls or doors immediately surrounding the selected area constitutes a glass hazard. Enter "yes" or "no" in the appropriate column. If "yes," enter in the remarks section an indication of the amount of glass in relation to the total wall space and its location. For example, "20 percent glass located in doors opening on area."

(f) *Item 22—Hung ceiling (yes or no).*—A hung ceiling is a plaster ceiling suspended by wires or other fasteners a short distance from the floor above, usually for the purpose of concealing pipes, ducts, and other items. Enter "yes" or "no" in the appropriate column.

(g) *Item 23—Heavy ceiling fixtures (yes or no).*—Any large lighting fixture or heavy plaster ornament in the area selected may constitute a hazard. Enter "yes" if such a hazard exists in the selected area.

(h) *Item 24—Heavy files, safes, machines, and other items, above the area (yes or no).*—If the next story floor directly above the area has an unusually heavy concentrated load such as a row of filing cabinets, a safe, or a piece of heavy machinery, enter "yes." If there is no such overhead concentrated load, enter "no."

(i) *Item 25—Steam pipes or boiler in area (yes or no).*—If the area selected contains a steam boiler or furnace of any kind, or if it contains steam pipes larger than 3 inches in diameter (inside dimension), or if it is known that the walls immediately surrounding the area contain such pipes, enter "yes." If this condition does not exist, enter "no."

(j) *Item 26—Water or gas pipes in area (yes or no).*—If the area selected contains water or gas pipes larger than 3 inches in diameter (inside dimensions), or if it is known that the walls immediately surrounding the area contain such pipes, enter "yes." If this condition does not exist, enter "no."

(k) *Item 27—Distance in feet to outer walls.*—Determine the approximate number of feet in each direction (north, east, south, and west) from the boundaries of the area selected to the outside of the building and enter this figure in each case on the line (*north, east, south,* or *west*) most nearly appropriate.

(l) *Item 28—Number of permanent walls.*—Count the number of walls in each direction between the area and the outside of the building. Only permanent walls are to be counted, not partitions. See definitions under item 15, p. 20. Make sure that the wall considered is completely between the entire selected area and the outside of the building. It would be best to refer to the line sketch or floor plan to determine the number of such walls. Include walls even though they have glassed areas.

(m) *Item 29—Is the outer wall below ground or against another building? (yes or no).*—These spaces are to indicate openness or shielding from outside the building. Investigate the outside of the building in each direction and enter "yes" if either of the following conditions exists:

(1) If there is a directly adjoining building (not separated by a space of more than 1 foot) at least as high as the ceiling of the area under consideration.

(2) If the exterior walls on the level of the area under consideration are 80 percent below ground level.

If neither of these conditions exists in the direction being considered, enter "no" on that line.

(n) *Item 30—Percentage of window space on outer walls.*—Enter an estimate (in multiples of 10) of the percentage of window area against total wall area for outside walls in each direction. Do not take too much time on this item, but make the best estimate possible by observation.

(o) *Item 31—Are there exits on two or more sides of building? (yes or no).*—This item is to be answered only for the basement and first floor. Exits as used here mean doorways directly to the outside. If there are exits on two, three, or four sides of the building enter "yes." Otherwise enter "no."

(p) *Items 32 and 33—Stairways.*—These items apply to the subbasement, if any, and to the second and higher floors, and are in place of the question on exits.

(1) *Item 32—Number of stairways against outer wall.*—Enter the number of stairways against outer walls of the building that can be reached from the area. If a stairway can be reached, but is difficult to reach, put in a footnote to this effect.

(2) *Item 33—Number of stairways in interior.*—Enter the number of stairways within the interior or center of the building that can be reached from the area.

(q) *Item 34—Number of floors (including roof) above.*—Enter the number of floors above the selected area, including the roof. This will be a decreasing number as you proceed from the basement upward.

(r) *Item 35—Number of workers or residents on this story.*—Enter the number of workers or residents on the entire floor. These are persons who normally work or stay in the building during most of the work day.

(s) *Item 36—Number of transients on this story.*—Enter for each floor the number of transients at the peak time. Transient population includes shoppers, doctors, patients, persons paying bills, and all persons who are on similar errands. These transients usually stay at one place for a relatively short period of time. Do not include

transient population resulting from exaggerated high peak periods which are more or less intermittent. For example, Christmas or Easter shopping crowds, parade crowds, and similar groups should be ignored when arriving at the peak transient population.

(t) *Item 37—Total.*—Enter the total population for each floor by adding the entries in items 35 and 36. For group A buildings the total of all entries on line 37 should be roughly the same as the largest of the three figures entered under *Number of persons at normal peak occupancy* in item 13.

ITEMS 38–40

3.43 Items 38 through 40 are for office use. Make no entries on these lines.

SIGNATURE

3.44 On the bottom of the last sheet, the person who completed the schedule should sign his name and enter the date.

CONCLUSION

3.45 Even though many of the items on some lines will be identical with those of the lines above, you should fill in every entry. Do not use dittos or dashes.

3.46 Again, make sure that every unusual situation is explained in the remarks section. Such remarks are a valuable aid in assisting the persons who must analyze the information. If there is any question at all, call your supervisor.

Instructions for Completing the On-Street Population Count, FCDA Form 124 (Instruction S–107)

3.47 In order to determine the total need for shelter it is necessary to obtain an estimate of the number of persons who are on the sidewalks and streets of each block. The estimate is not needed in residential blocks where such traffic is limited. The required estimate can be accomplished by making a count of the "on-street population" in two steps, (1) the pedestrian population and (2) the people riding in vehicles.

3.48 Your supervisor will instruct you as to the hour the count is to be made.

3.49 Two ways of making counts may be used. In cases where the volume of pedestrians on one side of the block is small enough to be counted within a few seconds, an instantaneous count will be made. If the volume of pedestrians is too heavy to count within a few seconds, a more detailed procedure will be utilized. For vehicles, an instantaneous count will always be made.

FCDA FORM 122
JUN 1951

Form Approved
Budget Bureau No. 97–5103

BUILDING ANALYSIS SCHEDULE

1. BUILDING NO. _____ 2. BLOCK NO. _____

3. TRACT _____ 4. CITY _____

5. NAME OF BUILDING _____

6. STREET ADDRESS OF BUILDING _____

7. PERSON IN CHARGE OF BUILDING (OWNER OR AGENT)
   a. NAME _____
   b. ADDRESS _____

8. PERSON SUPPLYING INFORMATION FOR THIS FORM
   a. NAME _____
   b. ADDRESS _____
   c. TITLE _____ d. PHONE NO. _____

9. PRINCIPAL USE:

(1) ☐ OFFICE BUILDING	(5) ☐ SCHOOL	(9) ☐ THEATER
(2) ☐ HOTEL	(6) ☐ FACTORY	(10) ☐ OTHER _____
(3) ☐ APARTMENT BUILDING	(7) ☐ HOSPITAL	_____
(4) ☐ STORE	(8) ☐ CHURCH	_____

10. THIS BUILDING WAS BUILT IN _____ (year) 11. IT CONTAINS ___ STORIES 12. AND IS _____ (about) FT. HIGH

13. HOURS OF OPERATION AND OCCUPANCY

HOURS BUILDING IS OPEN		HOURS OF NORMAL PEAK OCCUPANCY		NUMBER OF PERSONS AT NORMAL PEAK OCCUPANCY
Mon.-Fri. ___ AM TO ___ PM	☐ ALL HOURS	___ AM TO ___ PM	☐ ALL HOURS	
Saturday ___ AM TO ___ PM	☐ ALL HOURS	___ AM TO ___ PM	☐ ALL HOURS	
Sunday-Holidays ___ AM TO ___ PM	☐ ALL HOURS	___ AM TO ___ PM	☐ ALL HOURS	

14. ANY STORAGE OF LARGE AMOUNTS OF EXPLOSIVE OR INFLAMMABLE MATERIAL IN THIS OR ANY ADJACENT BLOCK?

☐ NO

☐ YES - SPECIFY _____

_____

15. WALLS, FLOORS AND ROOF

	THICKNESS (in.)	PRINCIPAL MATERIAL
1. EXTERIOR WALLS		
2. INTERIOR WALLS		
3. PARTITIONS		
4. FLOORS		
5. ROOF		

16. THIS BUILDING IS OF THE FOLLOWING TYPE OF CONSTRUCTION:

GROUP A
(1) ☐ STEEL FRAMED
(2) ☐ REINFORCED CONCRETE FRAMED

GROUP B
(3) ☐ SEMI-FRAMED (STEEL OR REINFORCED CONCRETE)
(4) ☐ MASONRY WALL BEARING
(5) ☐ WOOD FRAME (MASONRY OR WOOD OR OTHER COVERING)
(6) ☐ OTHER _____

FOR GROUP A BUILDINGS SELECT TWO POTENTIAL SHELTER AREAS IN SUB-BASEMENT AND BASEMENT (IF ANY) AND FOR ALL STORIES EXCEPT THE TOP THREE. COMPLETE ALL ITEMS FOR EACH SELECTED POTENTIAL SHELTER AREA. COMPLETE ITEMS 35, 36 AND 37 FOR TOP THREE STORIES AS WELL.

ITEMS WITH AN ASTERISK (*) ARE TO BE ANSWERED "YES" OR "NO"

17. STORY NUMBER		SUB-BASEMENT		BASEMENT		1st STORY		2nd STORY		3rd STORY	
18. POTENTIAL SHELTER AREAS		1	2	1	2	1	2	1	2	1	2
19. NORMAL USE? (SEE CODE)											
20. SQUARE FEET OF USABLE SPACE											
21. GLASS HAZARD IN WALLS AROUND SHELTER AREA?*											
22. HUNG CEILING OVER SHELTER AREA?*											
23. HEAVY CEILING FIXTURES OVER SHELTER AREA?*											
24. HEAVY SAFES, FILES, MACHINES, ETC. ABOVE SHELTER AREA?*											
25. STEAM PIPES OVER 3" IN DIAMETER OR BOILER IN AREA?*											
26. WATER OR GAS PIPES OVER 3" IN DIAMETER IN AREA?*											
27. DISTANCE IN FEET TO OUTER WALL ON--	NORTH										
	EAST										
	SOUTH										
	WEST										
28. NUMBER OF PERMANENT WALLS INCLUDING OUTER WALL TOWARD--	NORTH										
	EAST										
	SOUTH										
	WEST										
29. IS THE OUTER WALL ON THIS STORY BELOW GROUND OR AGAINST ANOTHER BUILDING ON THE--*	NORTH										
	EAST										
	SOUTH										
	WEST										
30. PERCENTAGE OF WINDOW SPACE ON OUTER WALLS ON--	NORTH										
	EAST										
	SOUTH										
	WEST										
31. ARE THERE EXITS ON TWO OR MORE SIDES OF BLDG?*		XXX						XXX		XXX	
32. NUMBER OF STAIRWAYS AGAINST OUTER WALL				XXX		XXX					
33. NUMBER OF STAIRWAYS IN INTERIOR				XXX		XXX					
34. NUMBER OF FLOORS INCLUDING ROOF ABOVE THIS STORY											
35. NUMBER OF WORKERS OR RESIDENTS ON THIS STORY											
36. NUMBER OF TRANSIENTS ON THIS STORY											
37. TOTAL (Item 35 Plus Item 36)											
38. OFFICE USE ONLY											
39. OFFICE USE ONLY											
40. OFFICE USE ONLY											

FOR GROUP B BUILDINGS, SELECT TWO POTENTIAL SHELTER AREAS IN SUB-BASEMENT AND BASEMENT ONLY AND COMPLETE ALL ITEMS FOR EACH.

IF THERE IS NO SUB-BASEMENT OR NO BASEMENT IN THE BUILDING, ENTER "NONE" ACROSS TOP OF COLUMN.

4th STORY		5th STORY		6th STORY		7th STORY		8th STORY		9th STORY		10th STORY					
1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2

REMARKS AND SKETCHES

MADE OUT BY _____ DATE _____

EVALUATION BY _____ DATE _____

Method of Instantaneous Counting

3.50 This procedure is the simpler and more direct way of counting the population on the streets at a given time. It involves making a "snapshot" count of the pedestrians and vehicles on each side of a block. The procedure is as follows:

(a) Station yourself in the middle of the block across the street from the sidewalk involved, at a point from which you can see the entire length of the block. A position somewhat above the sidewalk, such as on the steps or on the second floor of a building is best.

(b) Count the number of persons who are walking or standing in the block. This must be done quickly in order to eliminate the possibility of any overcounting.

(c) In the same way, count the number of vehicles on the side of the street next to the particular block you are counting. One count should be of the number of passenger cars and trucks, and another of buses and street cars. If a traffic signal controls the vehicles being counted, count during a period when the light is red. One suggestion is to spot a distinctive appearing vehicle that will enter the block on the next signal light change. Starting at the other end of the block count back until you have counted all vehicles up to and including the spotted vehicle. Make sure, however, that this vehicle does not pass any cars by traveling through an empty lane.

3.51 This procedure can be accomplished by one person if the amount of the traffic is relatively light. In some cases, however, where the traffic is heavier, two observers may be needed. Both observers should station themselves as described above. To count pedestrians, the observers should "sight" a point in approximately the middle of the block being observed. At a given instant, one observer counts the pedestrians to the right of the "sighted" point to the end of the block, while the other counts all pedestrians to the left of that point to his end of the block. This count must also be made within a few seconds.

3.52 To count vehicles, one observer, at a given instant, spots a distinctive appearing vehicle as it enters the block. He notifies the second observer to start counting vehicles leaving the block at the other end. When the first observer sees that the "spotted" car has reached the other end of the block, he notifies the second observer to stop his count.

3.53 When counting vehicles, it may be possible for one observer to call out the number of persons in each vehicle while the second observer writes down these numbers. In this manner it will be possible to obtain the number of persons in vehicles as well as the number of vehicles. (See instructions under Passenger Count, page 35.)

Method of Detailed Pedestrian Count

3.54 It is expected that a pair of observers can make an instantaneous count of vehicles even in cases where the number of vehicles is large on a given side of the block. For a block with a large number of pedestrians, however, this may not be possible, and the following procedure should be used:

(a) Starting at one end of the block, walk toward the other end at a rate of speed slightly faster than the rate of the pedestrian flow. Count each person you pass, no matter in what direction he is headed, and subtract from your count each person who overtakes you. Include in your count each person who is standing still, window shopping, waiting for a street car, or having a conversation, as well as any jaywalkers coming across the street. When you come to the end of the block, enter the number you counted on FCDA Form 124 on line *a. Going.*

(b) Walk back to the other end of the block and count persons in the same way as in paragraph (a) above. Enter your count on FCDA Form 124 on line *b. Returning.*

Completing FCDA Form 124

3.55 The on-street population count, FCDA Form 124 has provisions for making three separate counts for a block. Your supervisor will instruct you as to the hour the count is to be made.

3.56 The boundaries of the block, the block and tract numbers, the city, and the date and time of the observation, will already have been filled out.

3.57 Four columns titled *N* (north), *E* (east), *S* (south), and *W* (west) provide for entries for each side of the block. The items are completed as follows:

(a) Lines *a*, *b*, and *c* are to be utilized when counting pedestrians by the detailed method.

(b) Line *d* is to be used either to enter half of the sum on line *c* (detailed method) or to enter directly the count of pedestrians when the instantaneous method is used.

(c) On line *e* the count of passenger cars and trucks is entered; on line *f* the number of street cars and buses is entered.

(d) Line *g* is to be used to convert the numbers of vehicles on line *e* and *f* to the equivalent number of persons in those vehicles. See instructions below on Passenger Count.

(e) Line *h* is used to enter the sum of the pedestrian and vehicular count by adding the entries on line *d* and line *g*.

PASSENGER COUNT

3.58 Since the count has been made of vehicles it is necessary to obtain an average of the number of passengers in passenger cars and trucks, and an average of the number of persons in buses and street cars. This count is to be made only once for each side of the block.

3.59 Under the heading *Passenger Cars and Trucks* enter the number of persons in each passenger car and truck as it passes you until you have counted 10 vehicles. Also, enter an estimate under the section titled *Street Cars and Buses* of the number of persons in five such vehicles. If no street cars or buses are entered on line *f* you need not make this count. If a pair of observers is working together, one may call the numbers out while the other makes the entries.

3.60 Add the digits under the heading *Passenger Cars and Trucks*, and enter it in the column *Total*. In the same way add the numbers in the column *Street Cars and Buses* and enter the sum in the *Total* column.

3.61 In the *Average* column of *Passenger Cars and Trucks*, compute the average by dividing the number of persons in the *Total* column by 10 (to one decimal). In the same manner compute the average persons per *Street Cars and Buses* by dividing the number of persons in the *Total* column by 5 (to one decimal).

3.62 These averages should be applied to a given side of the block by kind of vehicle. For each side of the block the average for passenger cars and trucks should be multiplied by the entry on line *e*. Similarly, the average for buses and street cars should be multiplied by the entry on line *f*. The sum of these two should then be entered on line *g*.

FCDA FORM 124
JUN 1951

Form Approved
Budget Bureau No. 97–5103

ON-STREET POPULATION COUNT

BLOCK NO._____ TRACT NO._____ SHEET _____ OF _____ SHEETS

CITY _____ ASSIGNED TO: _____

BLOCK BOUNDARIES: NORTH _____ EAST _____

SOUTH _____ WEST _____

COUNT 1. DATE _____ TIME _____				
PEDESTRIAN	N	E	S	W
a. Going				
b. Returning				
c. Sum (a + b)				
d. Half of Sum (c/2)				
VEHICLE	N	E	S	W
e. Passenger cars Trucks				
f. Buses, Street Cars				
g. Equivalent In Persons				
h. Total (d + g)				

COUNT 2. DATE _____ TIME _____				
PEDESTRIAN	N	E	S	W
a. Going				
b. Returning				
c. Sum (a + b)				
d. Half of Sum (c/2)				
VEHICLE	N	E	S	W
e. Passenger cars, Trucks				
f. Buses, Street Cars				
g. Equivalent In Persons				
h. Total (d + g)				

COUNT 3. DATE _____ TIME _____				
PEDESTRIAN	N	E	S	W
a. Going				
b. Returning				
c. Sum (a + b)				
d. Half of Sum (c/2)				
VEHICLE	N	E	S	W
e. Passenger cars, Trucks				
f. Buses, Street Cars				
g. Equivalent In Persons				
h. Total (d + g)				

AVERAGE FOR BLOCK (OFFICE ONLY)

COUNT	N	E	S	W	TOTAL
1					
2					
3					
TOTAL					
AVERAGE					

PASSENGER COUNT

PASSENGER CARS AND TRUCKS							TOTAL	AVE.
N								
E							TOTAL	AVE.
S							TOTAL	AVE.
W							TOTAL	AVE.

STREET CARS AND BUSES							TOTAL	AVE.
N								
E								
S								
W								

EDITING, SCORING, AND SUMMARIZING THE SURVEY

Instructions for Editing and Scoring Building Analysis Schedule, FCDA Form 122 (Instruction S–108)

EDITING FCDA FORM 122

4.1 To insure an accurate rating of potential shelter areas, the following items must be completed. If these items are omitted or if there is any suspicion that they are incorrectly filled, a call-back must be made to obtain the necessary and correct information.

(a) *Item 11.*—There should be either an entry here or a reference to the remarks section and an explanation of the situation given there. If the latter, item 12 must be completed accurately.

(b) *Item 13.*—Under both *Hours Building is Open* and *Hours of Normal Occupancy*, either there must be inclusive figures, or the *all hours* box must be checked for each of the three categories. Under *Number of Persons at Normal Peak Occupancy* there must be an entry for each of the three categories. If the building is a Group A building (see item 16), the largest of the three figures entered here should agree roughly with the total of floor-by-floor counts in item 37, or there should be a notation in the remarks section explaining the situation.

(c) *Item 14.*—Either *yes* or *no* must be checked. If *yes* is checked, be sure the situation is of the type considered hazardous. See Instruction S–106, item 14.

(d) *Item 16.*—One category (and one only) must be checked. Since the correctness of this item is fundamental to the validity of the scoring system, there must be no possibility of error here. If the information was obtained from reliable maps or from a responsible municipal source (such as building inspector or fire department), there should be no question of doubt. If, however, the information was obtained in the field, the entries under item 8, *Person supplying information for this form*, should be examined and, if necessary, further investigation made until the reliability of this information is established beyond doubt.

(e) *Items 17 through 37.*—The columns *Sub-basement* and *Basement* should be completed for items 17 through 37 for all buildings for which this schedule is used, or the word "none" should be entered at the top of the column. In addition, if one of the Group A categories is checked in item 16, the columns headed *1st Story, 2nd Story,* etc., should be completed for all stories except the top three. Examine item 11 to determine number of stories in building. Items 35, 36, and 37 should be completed for top three stories as well.

4.2 If any items are not completed, there should be a note in the remarks section explaining the situation.

Scoring FCDA Form 122

4.3 All scores are entered on pages 2 and 3 of the form. Scores are placed under the appropriate column and on the appropriate lines beside the original entries. It is suggested that scores be entered with red pencil or in some color different from that used for original entries.

(a) *Item 14.*—If *no* is checked enter "1" in item 38 in each column completed for this building. If *yes* is checked, enter "0" in each column.

(b) *Item 16.*—If either of the categories in Group A is checked, enter "20" in item 39 in each column completed for this building. If any of the categories in Group B is checked, enter "9" in item 39 in each column completed for this building.

(c) *Items 19 and 20.*—These items are not scored. However, if "AU" or "OT" is entered in item 19, the schedule should be reviewed by the supervisor.

(d) *Item 21.*—If "no" is entered, score "5." If "yes" is entered, score "0."

(e) *Items 22 through 24.*—Consider these three items together and score as follows for each column: If all three entries are "no," score "1" in item 24. If one or more entries are "yes," score "0" in item 24.

(f) *Items 25 and 26.*—Consider these two items together and score as follows for each column: If both entries are "no," score "2" in item 26. If one entry is "yes," one "no," score "1" in item 26. If both entries are "yes," score "0" in item 26.

(g) *Items 27, 28, and 29.*—These three items are interacting, and scoring involves three steps to be taken in order:

(1) Compare the entries after *north, east, south,* and *west* in item 27 with corresponding entries in item 28. If entry in item 27 is 20 or more, circle corresponding entry in item 28, provided the number is 2 or more in item 28. If entry is less than 20, do nothing.

(2) Proceed to item 29. If entry after *north*, *east*, *south*, and *west* is "yes," circle corresponding entry in columns 1 and 2 in item 28. If entry is "no" do nothing.

(3) Score item 28 as follows: If all numbers are circled, score "20." If there are any uncircled numbers, choose the lowest and score as follows: If lowest uncircled number is 2 or more, score "9." If lowest uncircled number is 1, score "0."

(h) *Item 30.*—This item is not scored.

(i) *Item 31.*—This item is for basements and first stories only. Score as follows: If entry is "yes," score "5." If entry is "no," score "0."

(j) *Items 32 and 33.*—These items are for sub-basement and 2nd story and above. They are in place of item 31. Consider these two items together, and score as follows: If entry for item 33 is 1 or more, score "5" regardless of entry for item 32. If entry for item 33 is 0 and entry for item 32 is 1 or more, score "3."

(k) *Item 34.*—Score as follows: If entry is 4 or more, score "20." If entry is 3, score "9." If entry is 2 or less, score "0."

(l) *Items 35, 36, and 37.*—These three items are not scored.

Check List and Total

4.4 Form 122 is completed by the following:

(a) *Checking.*—Review the scoring. Scores should be entered under columns 1 and 2 for each story level in items 21, 24, 26, and 28. Scores should be entered for each story level in item 31 (or alternatively in 32 and 33) and in items 34, 38, and 39.

(b) *Item 40.*—The total score is entered here for areas 1 and 2 of each story level. In making totals, the scores for items 31, 32, 33, 34, 38 (from item 14; see above) and 39 (from item 16; see above) are added first to the scores in column 1 for each story and then to the scores in column 2 for the same story.

Instructions for Summarizing and Tabulating Shelter Areas and Population (Instruction S–109)

Summarizing Square Feet of Shelter Area by Rating Score, FCDA Form 125

4.5 After the rating scores have been entered in item 40 of the building analysis schedules, the next step is to summarize the square feet of usable space in each shelter area by its rating score. FCDA Form 125, Shelter Areas by Rating Score, is used for this purpose for all buildings that have any reported shelter areas.

4.6 For Group A buildings of six or more stories, FCDA Form 125 summarizes the information separately for the sub-basement, base-

ment, first, and second stories, and for the third and above stories. For each of these two sections of the building, the population, square feet of shelter, and number of persons that can be accommodated is computed for Category I shelter. If there is a deficit in the upper part of the building, that deficit is absorbed by the surplus, if any, in the lower part of the building. After the accommodations for the occupants of the building have been computed, the surplus of shelter in the sub-basement, basement, first, and second stories, if any, will be considered as available to persons from outside the building. Regardless of its score, any surplus shelter on the third and above stories will not be considered available to persons from outside the building.

4.7 From the building analysis schedule fill in the items in the heading of FCDA Form 125; building number, block and tract numbers, name and address of the building, and the city.

4.8 The following summarization should be done separately for the shelter areas in the sub-basement, basement, first and second stories (item A) and the shelter areas on the third and above stories (item B). For Group A buildings of five stories or less and for Group B buildings, only item A should be completed.

(a) For item A, add the population of the sub-basement, basement, first and second stories from item 37 of FCDA Form 122, and enter the total on line *1* under the column headed *Category I*. Use the same procedure for item B by adding the population of the third and above stories, and enter the total on line *1*.

(b) Add the square feet in each of these areas rated from 70 through 74 and enter the total square feet on line *2* under the appropriate column. Do the same for the 64–69 and 55–63 categories.

(c) For line *3*, under Category I (for items A and B) divide the number on line *2* by 6 (to provide 6 square feet per person) and enter the quotient on line *3*.

(d) For line *4*, compare the number on line *3* with the population on line *1*. If the number on line *3* is greater than the population, compute the difference and enter it on line *4*. (Example "250".) This represents a surplus of shelter area in Category I. If the population is greater than the entry on line *3* compute the difference and enter it on line *4* with a minus sign preceding it. (Example "−250".) This represents a deficit of shelter space for this group. Apply this procedure to item B figures under Category I in the same manner.

(e) If the only entry in item B is population (line *1*), repeat this number on line *4* and prefix it with a minus sign.

(f) If there is a minus value on line *4* of item B, transcribe the number from line *4* to line *5* of item C. Also, transcribe the number from line *4* of item A to line *6* of item C. Compute on line *7* the net minus or plus value. This will indicate how many square feet of shel-

ter area might be available for persons from outside the building if there is a surplus. If there is no deficit of shelter area on the third and above stories, the surplus or deficit shelter accommodations will be indicated on line *4* of item A. Any surplus on the third and above stories will not be considered as available to persons outside the building.

Summary of Building Analysis Schedules, FCDA Form 126

4.9 FCDA Form 126 is used to summarize some of the information from the block listing sheets and the building analysis schedules for a block. It can also be used to summarize a group of blocks, tracts, or wards.

4.10 In the heading, enter the name of the city and the geographical area being summarized, that is, block 1, blocks 1–10, tract 3, ward 4, etc.

4.11 The following outlines the method of summarizing a block:

(a) *Columns 1 and 2, Side of Block, Building Number, and Address.*—All buildings on the north side of the block should be summarized first from the block listing sheet, FCDA Form 121. In column (1), enter the building number. In column (2), enter "north-total" on the first line and list all addresses on the north side of the block. At the end of the list of addresses for a side of the block enter "on-street population."

(b) *Column 3, Total Population.*—Enter the sum of the total population for each building from line *1*, items A and B, FCDA Form 125. For private dwellings and for buildings of three or less stories without basements, the figure is obtained from columns 4 and 7 respectively of FCDA Form 121. Enter opposite "on-street population" the total count for this side of the block from FCDA Form 124, On-Street Population Count.

(c) *Column 4, Deficit or Surplus of Persons in Category I Accommodations.*—This already has been computed on FCDA Form 125 for each building having any shelter area. If item C has been completed, transcribe the minus or plus value from line *7*. If not, the figure on line *4* of item A (under Category I) should be transcribed. For private dwellings and for three-or-less-story buildings with no basement and for "on-street population count," the population figure will be entered here with a minus sign prefixing it from columns 4 and 7 respectively, of FCDA Form 121.

(d) *Columns 5 and 6, Square Feet in Categories II and III.*—From item A only of FCDA Form 125, transcribe from line *2* the square feet of shelter area in Category II (64–69) and Category III (55–63).

(e) *Column 7, Type of Construction.*—Enter the type of construction of the building, "SF" for steel-framed, "RC" for reinforced-con-

crete-framed, "WB" for wall-bearing, "WF" for wood frame from item 16 of FCDA Form 122. For private dwellings, enter "PD," and for three-or-less-story buildings with no basement, enter "NB."

(f) *Column 8, Number of Stories.*—Enter the number of stories from item 11 of FCDA Form 122. No entry will be made here for private dwellings or buildings of three or less stories without a basement.

(g) *Column 9, Year Built.*—Enter the year the building was built from item 10 of FCDA Form 122. No entry will be made here for private dwelling or buildings of three or less stories without a basement.

4.12 FCDA Form 126 can also be used for summaries of groups of blocks, tracts, wards, etc. Delete the title over column 2 and enter whatever item is being summarized, i. e., "block number," "tract number," "ward number," etc. In such cases, columns 7, 8, and 9 will be left blank.

Form Approval
Budget Bureau No. 07-5103

SHELTER AREAS BY RATING SCORE

NAME OF BUILDING _____ BUILDING NO. _____

ADDRESS OF BUILDING _____ BLOCK NO. _____

CITY _____ TRACT NO. _____

ITEM	A. For Sub-basement, Basement, 1st and 2nd Stories			B. For the 3rd and above Stories		
RATING GROUP	Catg'y. I (70-74)	Catg'y. II (64-69)	Catg'y. III (55-63)	Catg'y. I (70-74)	Catg'y. II (64-69)	Catg'y. III (55-63)
1. POPULATION		XX	XX		XX	XX
2. TOTAL SQUARE FEET						
3. SQUARE FEET DIVIDED BY 6		XX	XX		XX	XX
4. DEFICIT OR SURPLUS		XX	XX		XX	XX

ITEM C

IF DEFICIT IN CATEGORY I IN ITEM B (LINE 4), COMPLETE LINES 5, 6, AND 7.

	Category I (70-74)
5. ENTRIES FROM ITEM B, LINE 4	
6. ENTRIES FROM ITEM A, LINE 4	
7. NET DEFICIT OR SURPLUS	

NOTES

FCDA FORM 125
JUN 1951

Form Approved
Budget Bureau No. 97-S103

SUMMARY OF BUILDING SCHEDULES

AREA _____ CITY _____ SUMMARY OF BUILDING ANALYSIS SCHEDULES

BLDG. NO. (1)	SIDE OF BLOCK STREET ADDRESS (2)	TOTAL POPULATION (3)	DEFICIT OR SURPLUS OF PERSONS ACCOM. IN CATEGORY I (4)	NO. OF SQUARE FEET IN CATEGORY		TYPE OF CONSTRUCTION (7)	NO. OF STORIES (8)	YEAR BUILT (9)
				II (5)	III (6)			

FCDA FORM 126
JUN 1951

CONCLUDING THE SURVEY

Significance of Scores (Instruction S–110)

TECHNICALLY TRAINED PERSONNEL

5.1 It is recommended that the responsibility of determining the actual usability of potential shelter areas be placed with teams of technically trained personnel. Leaders of such teams should be selected from the following groups only:

(a) Architects.
(b) Structural engineers.
(c) Builders (preferably nonresidential).
(d) Fire insurance inspectors and rating personnel.
(e) Municipal building inspectors.
(f) Experienced employees of the above, but not students or apprentices.

5.2 It is expected that the services of such personnel can be secured on a voluntary basis. Local chapters of national professional and trade associations in these fields should be consulted for assistance.

SHELTER AREA CATEGORIES

5.3 Technical teams should review completed building analysis schedules and on the basis of total scores assign potential shelter areas to one of the following categories:

(a) *Category I.*—Usable without further investigation. Rating 70–74.
(b) *Category II.*—First choice for investigation by technically trained personnel. Rating 64–69.
(c) *Category III.*—Second choice for investigation by technically trained personnel. Rating 55–63.
(d) *Category IV.*—Third choice to be considered only after thorough investigation and if a deficit in shelter exists. Rating 54 or under.

CATEGORY I

5.4 It will be noted that the scores of potential shelter areas cannot fall in Category I unless the area: (1) is in a framed building; (2) has good overhead protection in the form of at least four layers

of floor and roof overhead; (3) has good lateral protection by being located toward the center of a building or below ground level; (4) has no glass in walls immediately surrounding it; and (5) has facilities for exit to other levels of the building.

5.5 Building analysis schedules with scores that place areas in this category should be examined in detail by the technical teams before the area is recommended for use. The following items especially should be reviewed:

(a) *Item 19—Normal use.*—Hallways, corridors, and fire stairs are good locations for shelter areas. Offices and salesrooms are generally satisfactory. If, however, the normal use of a particular area is listed as "SR" (storeroom), it might be advisable to obtain from the owner or a responsible agent an assurance that the area of usable space listed under item 20 will always be free of merchandise, equipment, etc. In a few cases, the entry "AU" (auditorium) may be found under item 19 in connection with a Category I score. Such a combination will be rare and can only exist in the case of a theater or auditorium located within the core of a multistory building. Most theater auditoriums and other assembly halls will automatically be disqualified because of insufficient overhead or lateral protection or both. If "AU" is found in connection with a Category I score, the area in question should not be considered usable until the strength of its ceiling and overhead construction has been investigated. In spite of its score, it should be placed immediately in Category II.

(b) *Item 15—Walls, floors, and roof.*—Item 15 should be examined. If walls or floors of unusual construction are noted, it may be necessary to resurvey the building before its areas are designated as shelter. If floors are less than 4 inches thick, it may be necessary to reevaluate the area for item 34.

(c) *Item 22 through 26—Hazards.*—Scores within Category I will automatically reflect presence or absence of hazards. These items on the schedule should, however, be examined before final decisions are made.

(d) *Remarks section.*—Designation of areas as usable shelter areas should not be made until all unusual conditions listed in the remarks section of the schedule have been carefully considered.

Usable Shelter Areas

5.6 If, after examination of a particular building analysis schedule, it is the decision of the technical team that a particular area needs no further investigation, that area should be considered usable.

Category II

5.7 Potential shelter areas whose scores fall between 64 and 69 inclusive should be placed in Category II.

5.8 It will be noted that an area may fall into Category II by having one of the following deficiencies: (1) glass hazard, or (2) insufficient facilities for exit, or (3) both. The area may or may not have the hazards indicated in items 14 and 22 through 26. In addition a few areas may have been placed in this category because of their normal use as auditoriums. (See remarks under Category I above.)

5.9 If after an analysis of the shelter needs of a city block, a deficit of Category I shelter space is established, Category II areas should be considered next. Such areas should not, however, be designated as usable shelters until an actual investigation of the building has been made by a technical team.

Category III

5.10 If sufficient shelter space is available from neither Category I or II, areas with scores falling in Category III should be investigated. Category III areas may have one or more of the following major deficiencies: (1) they may be in Group B buildings (that is, semi-framed, wall-bearing, or wood frame); (2) they may have insufficient overhead protection; or (3) they may have insufficient lateral protection. They may or may not have sufficient facilities for exit, and may or may not contain the hazards indicated in items 14 and 22 through 26.

5.11 Category III areas and below should be investigated by technical teams and the cost of removing deficiencies carefully evaluated. In most cases this cost will probably be high and may be higher than the cost of building specially designed public shelters.

Category IV

5.12 Scores falling in Category IV represent areas with even more major or basic deficiencies than those in Category III. Areas with such scores are likely to require very extensive changes before they meet the standards set for Category I. The cost of such changes must be compared carefully with the cost of constructing new shelters.

5.13 In all cases, it should be remembered that, as a temporary expedient, the best available shelter (even though in the lowest category) is preferable to none at all.

Designation of Shelters (Instruction S–111)

5.14 When the summary of the building analysis sheets and block listing sheets has been completed for a particular block, the following will be known:

(a) The amount of shelter required for that block.

(b) The amount of shelter in Category I (that is, the amount usable without further investigation).

(c) The amount of potential shelter which is available for investigation and possible future use (Categories II and III). Blocks may then be treated in the following categories:

(1) Those blocks where some shelter of Category I exists.

(2) Those blocks where no shelter of Category I exists, but where potential shelter of Categories II or III exists.

(3) Those blocks having no potential shelter qualifying as Categories I, II, or III.

5.15 An immediate program should be undertaken for the designation of shelters within those blocks having shelters of Category I, and the program should continue as long as shelter in the second or third category is being made usable through improvements.

Kinds of Shelter

5.16 The usable shelter area will be of two kinds:

(a) That which, because of its location (usually on the third floor or above) is available only to the occupants of the building.

(b) That which, because of its location, is potentially usable by the on-street population or the population of other buildings as well.

5.17 It is anticipated that in the case of the shelter which can be used only by persons in the building, the only steps that need to be taken are:

(a) Getting the agreement of the building management that this is the area to be used as shelter.

(b) Placarding the area to indicate that it is to be used by the occupants on certain floors of the building.

(c) Informing the designated warden of this shelter area and working out with him the plan for moving the occupants of the building into the selected area.

5.18 Inasmuch as such areas will usually be open so long as there are occupants in this part of the building, it is not anticipated that there will be any problem of insuring that the shelter area is open during the hours it might be required.

Special Problems

5.19 Special problems may be encountered in the utilization of shelter areas where these are to be open to the public (that is, persons on the street or in other buildings within the block). There may be some cases in which an activity carried on within the building is such that its use as shelter would handicap the defense effort. This, for example, might be true in the case of certain utility buildings. Next, there may be problems because the shelter may be needed during hours when access to the shelter area cannot be obtained under present arrangements. Negotiations with the building management will have to be conducted and a clear agreement reached as to when the shelter

may be used. After agreement has been reached, a program will have to be conducted informing persons in other buildings as to the nearest available shelter and posting necessary signs for the guidance of the population on the street to the available shelter.

Shelter Signs

5.20 Shelter areas should be clearly marked so that occupants will have no doubt as to area limits. Directional signs should clearly indicate to all persons routes of travel to the nearest shelter area.

5.21 Building entrances should be appropriately marked so that on-street population will know how to get to shelter areas which have been reserved for them.

5.22 Figure 1 specifies the size and design of shelter signs recommended for indoor and outdoor use. Color and type of materials, including paint, to be used in the construction of these signs is optional. FCDA recommends signs made of any durable material with white letters on a dark background for indoor use. Signs made of weather-resistant material with high-visibility yellow or luminescent yellow letters on a dark background are recommended for outdoor use. Stencils and/or decalcomania also may be used.

Use of Information for Increasing Shelter Supply (Instruction S–112)

5.23 The survey presented in this manual is intended as the first step of a more comprehensive shelter program. One of its primary purposes is to give local civil defense personnel an indication of the amount of shelter space required beyond that available in Category I shelter areas in existing buildings. There will be many city blocks in which more shelter is needed than exists in Category I areas, many in which no Category I areas exist at all.

Category II Areas

5.24 For those blocks in which there are areas falling in Category II, consideration should be given to the possibility of improving some of these areas so that they will be usable as shelters. It has already been remarked (S–110, Significance of Scores) that Category II areas will usually require relatively minor changes (such as the removal of glass) to make them usable.

5.25 On the basis of the amount of shelter required for the population of the block (beyond that available in Category I areas), and on the basis of amount of usable space and other characteristics of the Category II areas, decisions should be made as to which of these Category II areas are the most likely candidates for investigation. A testing of the likely areas in order of priority should be made, and these

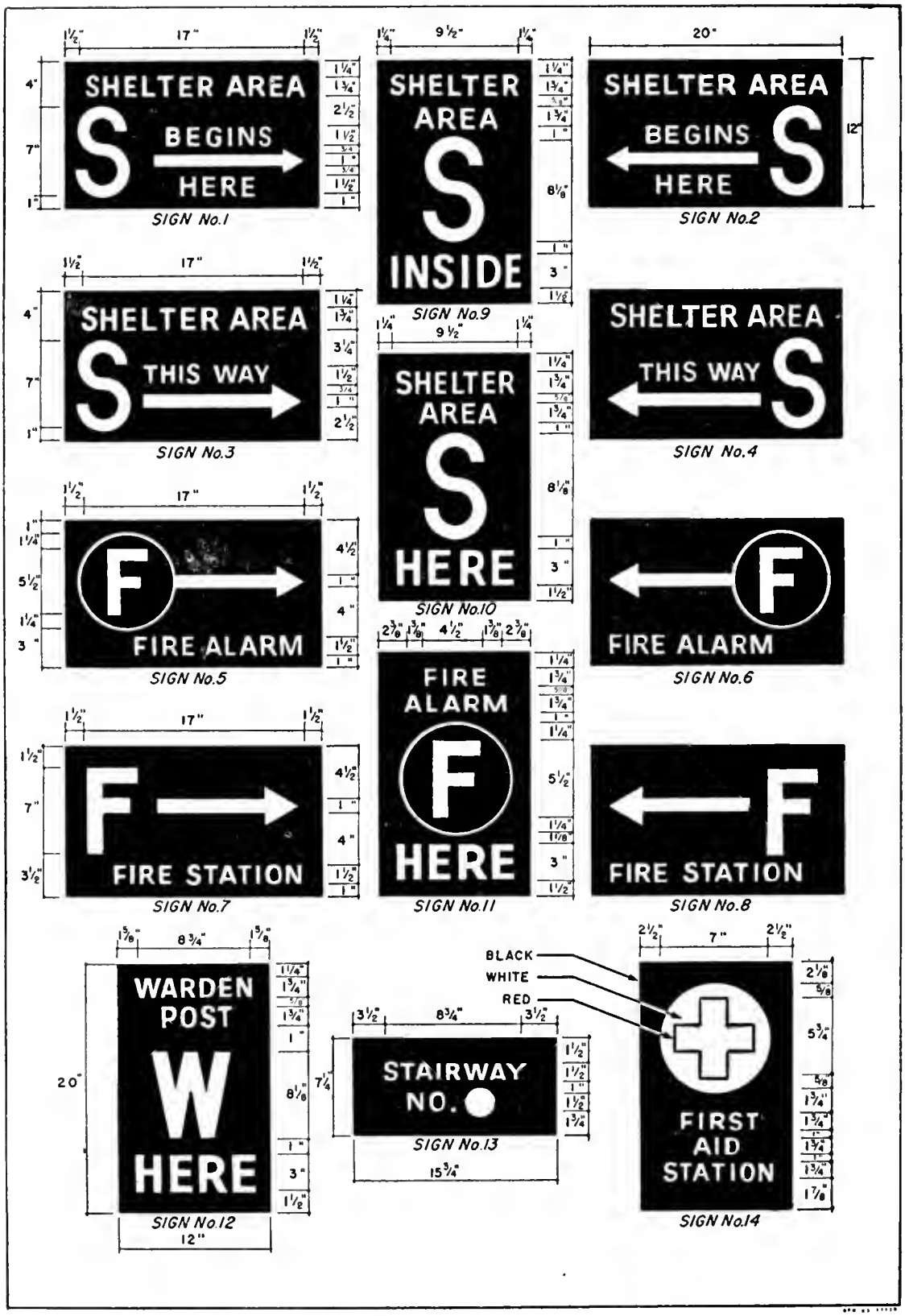


FIGURE 1.—Standard civil defense signs.

areas should be investigated by technically trained personnel. (See S–110, Significance of Scores.)

5.26 If the technical team recommends that improvements be made and if the building owner carries out such improvements, the improved Category II areas should be considered usable.

Category III Areas

5.27 If, after improvement of Category II areas, there still exists a deficit of shelter space in a particular block, it will be necessary to investigate the possibilities of Category III areas. Potential areas in Group A (or framed) buildings falling in this category will usually require major alterations before they can be utilized as shelter. For such areas careful consideration should be given to the cost of improvement before final decisions are reached.

5.28 Basement areas in some Group B buildings of the semi-framed or wall-bearing type will fall in Category III. Many of these areas can be made usable by the strengthening of the floor immediately above the area (that is, the floor serving as the shelter roof) so that it will carry the debris load which might result from complete collapse of the building. Suggestions for determining the strength of such floors and methods of improving them are given in Part II. (See inside front cover.) In some cases, potential areas of this type can be made usable at relatively little cost. However, all Category III areas should be carefully investigated by trained personnel and the cost of improvement estimated accurately before procedures for improving them are initiated.

5.29 When the cost of improvement is high, it will obviously be wise to compare such cost to that of building independent structures expressly designed as public shelters. If space is available for such structures and the cost of their construction lower than that of improving potential shelter areas in existing buildings, it would be foolish to consider making major alterations in a building in order to convert its areas to usable shelters.

Category IV Areas

5.30 Shelter areas below Category III (54 or under) are to be considered only after thorough investigation by technically trained personnel. Areas with such scores are likely to require very extensive changes. The cost of such changes must be carefully compared with the cost of building new shelters.

Blocks Composed Entirely of Private Dwellings

5.31 For blocks in which all or almost all of the buildings are private dwellings, the problem of shelter space will have to be solved either by the construction of public shelters or by the use of individual

home-type shelters. FCDA manuals describing both types are forthcoming.

Other Operations (Instructions S–113)

Organization of Survey Results

5.32 All records relating to the survey should be preserved in a careful and orderly fashion.

5.33 In preparing for the survey it was recommended that a control register by blocks be established. (See paragraph 2.21 (e), Instruction S–102.) In the instructions for supervising the field operation it was suggested that a large map might be useful as a visual aid for watching the progress of the survey. (See paragraph 3.8, Instruction S–103.)

5.34 On the basis of these documents it should be possible at any time to render a complete report as to what has been done as of that time in regard to the shelter program. If such reports are rendered on a periodic basis they will be very informative to all those who are concerned in the shelter program.

Submittal of Survey Results

5.35 Upon completion of the survey for any particular area, the completed block summaries, FCDA Form 126 shall be submitted in duplicate to the State director of civil defense. A suggested transmittal form is shown on page 53. One copy of this submittal will be for the use of the State. The other copy will be forwarded by the State director to the Federal Civil Defense Administration, Attention: director, shelter division, Washington 25, D. C.

5.36 It is vitally important that survey results be placed on file with the State director and the FCDA shelter division as soon as they are completed. State and Federal authorities will thus be continuously informed of the shelter needs of the various critical areas.

SUGGESTED TRANSMITTAL FORM

SHEET_____OF_____SHEETS

CITY _____

STATE_____

DATE_____

TO: _____

_____

FROM: _____

_____

1. Attached are completed FCDA Forms 126, Summary of Building Analysis Schedules, for this city.

_____ _____ _____

_____ _____ _____

_____ _____ _____

_____ _____ _____

_____ _____ _____

_____ _____ _____

_____ _____ _____

_____ _____ _____

_____ _____ _____

2. A city map showing block numbers also is attached. YES ☐ NO ☐

FOR PERSON IN CHARGE OF SURVEY:

SIGNATURE_____ TITLE_____

PANEL MEMBERS

GEORGE H. FIELD, *Chairman*
HARRY L. BOWMAN,
Atomic Energy Commission
LEO H. CORNING,
Portland Cement Association
JOHN W. DUNHAM,
Public Buildings Administration
ERIC L. ERICKSON,
Bureau of Public Roads
FRED R. FLETEMEYER,
Associated General Contractors
JEWELL M. GARRELTS,
American Society of Civil Engineers
RICHARD S. GREEN,
U. S. Public Health Service
JOHN D. GRIFFITHS,
American Institute of Steel Construction
H. E. HASSLER,
Corps of Engineers, U. S. Army
EZRA G. ODLEY,
Bureau of Yards and Docks, U. S. Navy
DOUGLAS E. PARSONS,
American Concrete Institute
FREDERIC A. PAWLEY,
American Institute of Architects

The following Federal Civil Defense Administration publications are on sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.

1. United States Civil Defense, 1950. 25 cents, 168 pages. The national plan for organizing the civil defense of the United States.

Administrative Guides

1. Civil Defense in Industry and Institutions, Pub. AG–16–1, 1951. 25 cents, 64 pages. Plans for organizing and administering civil defense self-protection programs for the Nation's industrial plants, office buildings, stores, apartment buildings and other institutions.
2. The Clergy in Civil Defense, Pub. AG–25–1, 1951. 10 cents, 12 pages. Guide for the clergy of all faiths to determine their place and function in civil defense.
3. Fire Services, Pub. AG–9–1, 1951. 15 cents, 27 pages. Guide to assist States and communities in planning, organizing, staffing, and operating an expanded fire-fighting service during periods of war emergency.
4. Health Services and Special Weapons Defense, Pub. AG–11–1, 1950. 60 cents, 264 pages. Methods for organization of all basic health and special weapons defense (atomic, biological, and chemical warfare) for State and local civil defense programs.
5. Police Services, Pub. AG–10–1, 1951. 20 cents, 48 pages. Basic guide for State and local civil defense officials in organizing and directing police civil defense services.
6. Principles of Civil Defense Operations, Pub. AG–8–1, 1951. 20 cents, 48 pages. Basic guide in planning and organizing for mutual aid and mobile support operations.
7. The Rescue Service, Pub. AG–14–1, 1951. 15 cents, 32 pages. Guide for State and local civil defense officials in organizing rescue services and training rescue teams.
8. The Warden Service, Pub. AG–7–1, 1951. 20 cents, 48 pages. Basic guide for civil defense directors and supervisory wardens in selecting, organizing, training, and equipping the warden service.

Public Booklets

1. Emergency Action to Save Lives, Pub. PA–5, 1951. 5 cents, 32 pages. Practical instructions for the untrained person on the emergency care of injured people.
2. Fire Fighting for Householders, Pub. PA–4, 1951. 5 cents, 32 pages. Basic information for the householder on how fires start, how they can be prevented, and how to fight a fire.
3. This is Civil Defense, Pub. PA–3, 1951. 10 cents, 32 pages. Highlights of the national civil defense program and the part the volunteer must play to make civil defense a success.
4. What You Should Know About Biological Warfare, Pub. PA–2, 1951. 10 cents, 32 pages. Techniques of personal survival under biological warfare attacks.
5. Survival Under Atomic Attack, 1951. 10 cents, 32 pages. Techniques of personal survival under atomic bomb attacks.

Technical Manuals and Handbooks

1. Fire Effects of Bombing Attacks, 1950. 15 cents, 45 pages. Summarizes data on World War II bombing attacks and suggests a method of appraising fire susceptibility of cities to minimize the effects of mass fires.
2. Outdoor Warning Device Systems, Pub. TM–4–1, 1951. 15 cents, 36 pages. Data for planning, procuring, and installing public warning device systems for civil defense.
3. Water Supplies for Wartime Fire Fighting, Pub. TM–9–1, 1951. 10 cents, 16 pages. Program for increasing available water supplies to meet the needs of emergency water-supply operations during wartime.
4. The Warden's Handbook, Pub. H–7–1, 1951. 15 cents, 34 pp. Basic reference aid for the block warden.